



Case study
Shelf life extension

Case study - Shelf Life Extension

Enzymatic cleaning program consisted of two phases

Phase 1:

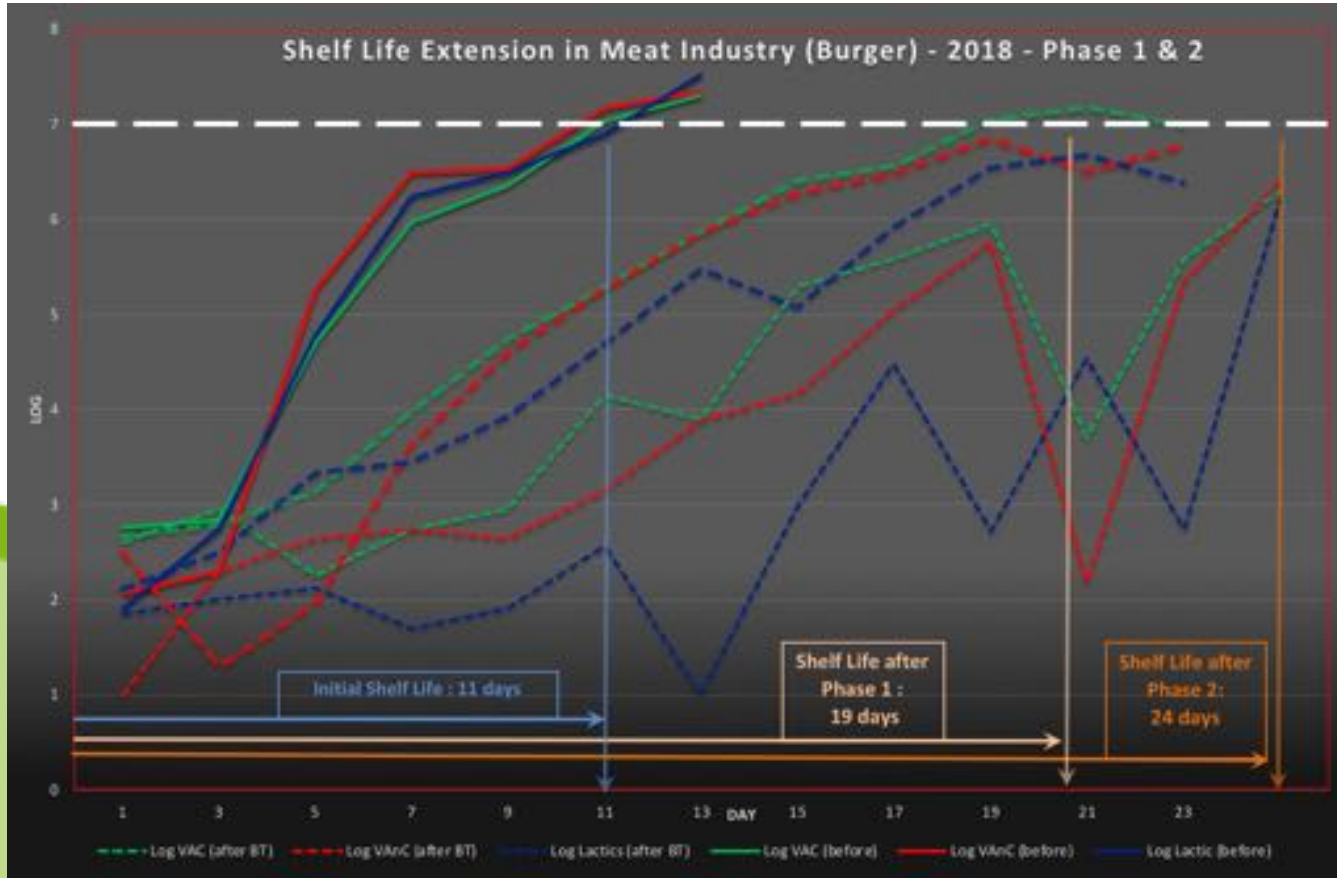
- Curative treatment of (5) cleanings in a row to eliminate existing biofilms using Biorem CD20 and Enzyfoam
- Preventative treatment: (1) cleaning every week using BioremFoam

Phase 2:

- Daily treatment with enzymes to prevent organic build-up using EnzyfoamPRO
- Preventative treatment: (1) cleaning every week to prevent biofilm using BioremFoam

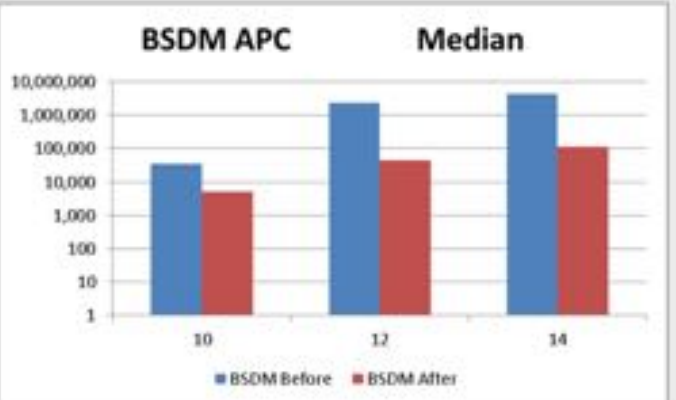
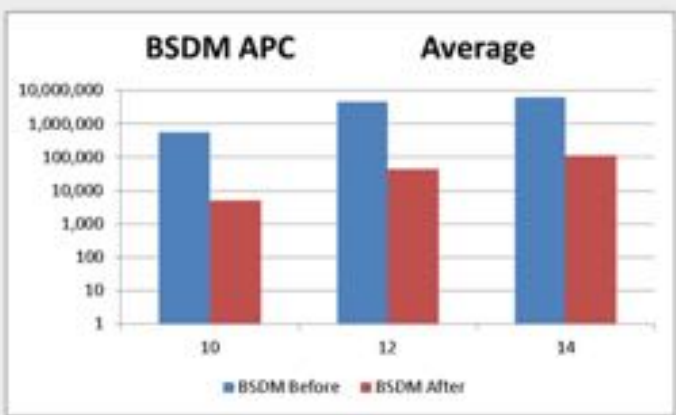
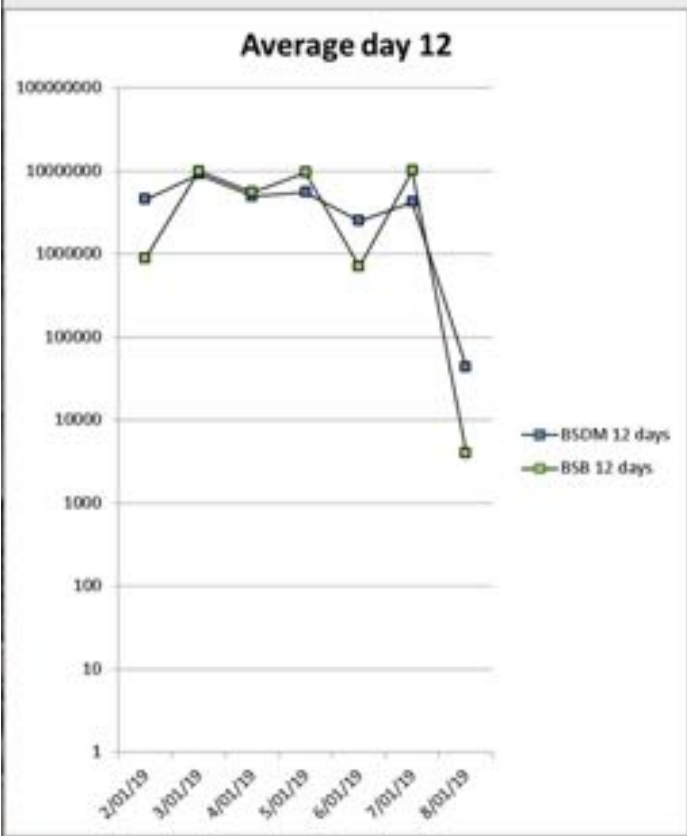
Case study - Shelf Life Extension

Results combined Phase 1 and Phase 2



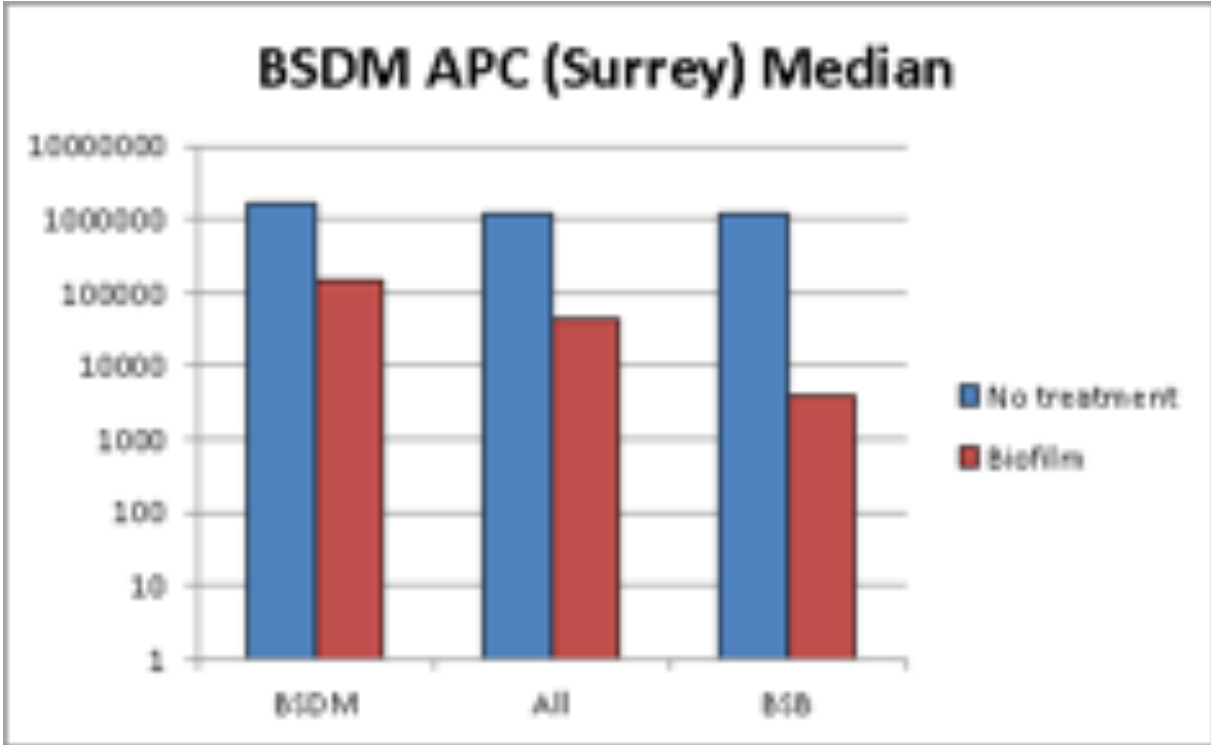
Case study 2 - Shelf Life Extension Poultry

Results Phase 1



Case study 2- Shelf Life Extension Poultry

Results Phase 1



Case study 3 - Shelf Life Meat Industry



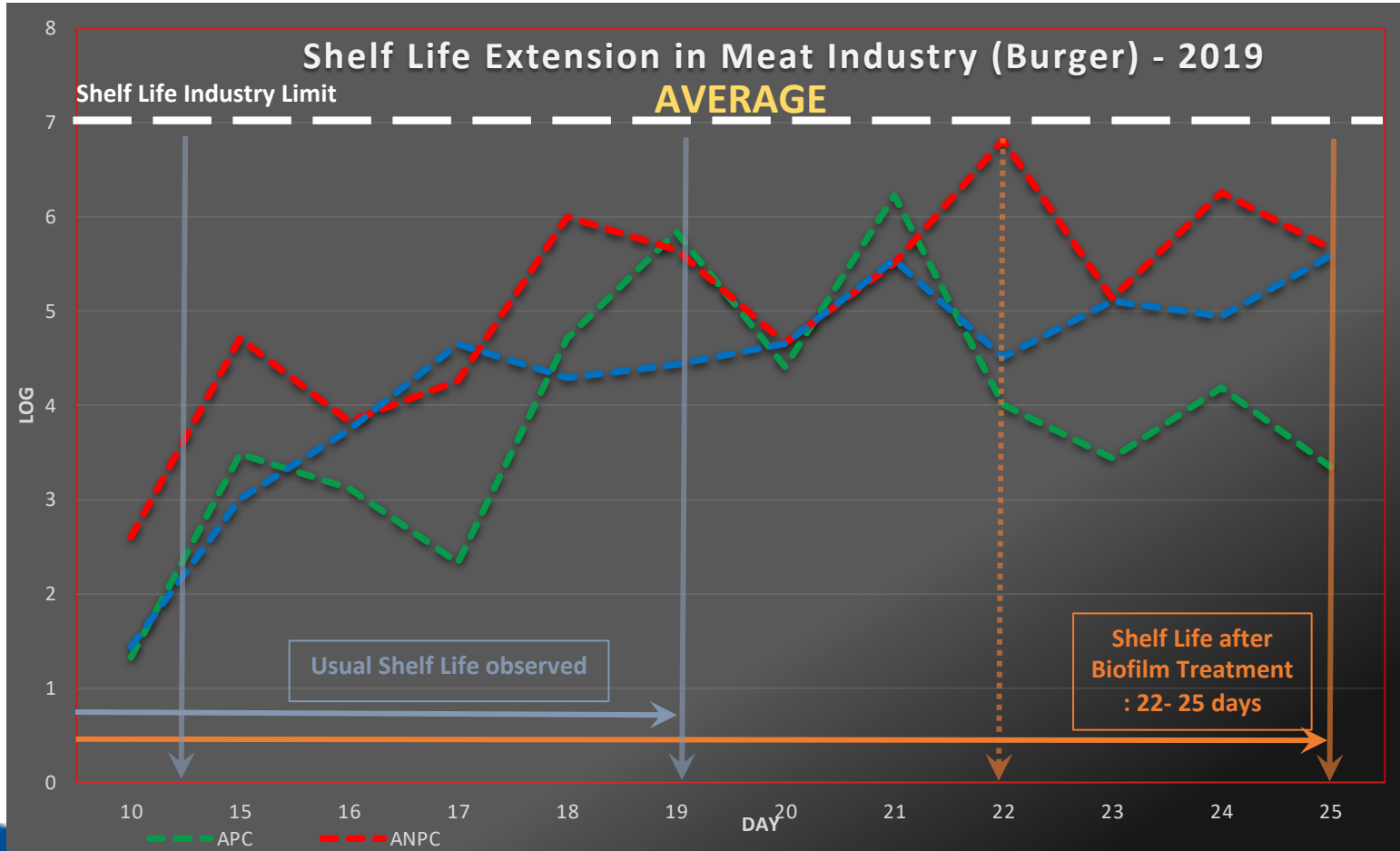
Case study 3 - Shelf Life Meat Industry



Case study 4 - Shelf Life Meat Industry

| Day | Shift | Line # | APC | APC | AnPC | ANPC | Lab | Lactic | Mold | Yeast |
|-----|-------|--------|-----------|-------------|-----------|-------------|---------|-----------|------|-------|
| 10 | 1&2nd | AVG | 21.25 | 1.327358934 | 400 | 2.602059991 | 28 | 1.4393327 | <10 | 30 |
| 15 | 1&2nd | AVG | 3,068 | 3.486784571 | 51,725 | 4.713700499 | 1,025 | 3.0107239 | <10 | 10 |
| 16 | 1&2nd | AVG | 1,315 | 3.118925753 | 6,750 | 3.829303773 | 5,550 | 3.744293 | <10 | <10 |
| 17 | 1&2nd | AVG | 215 | 2.33243846 | 18,250 | 4.261262869 | 44,523 | 4.6485795 | <10 | <10 |
| 18 | 1&2nd | AVG | 51,175 | 4.709057851 | 999,250 | 5.999674157 | 19,450 | 4.2889196 | <10 | <10 |
| 19 | 1&2nd | AVG | 692,500 | 5.840419778 | 447,500 | 5.65079304 | 27,175 | 4.4341696 | <10 | <10 |
| 20 | 1&2nd | AVG | 25,825 | 4.41204033 | 45,800 | 4.660865478 | 45,025 | 4.6534537 | <10 | <10 |
| 21 | 1&2nd | AVG | 1,675,000 | 6.224014811 | 320,000 | 5.505149978 | 347,500 | 5.5409548 | <10 | 60 |
| 22 | 1&2nd | AVG | 10,200 | 4.008600172 | 6,500,000 | 6.812913357 | 32,575 | 4.5128844 | <10 | 20 |
| 23 | 1&2nd | AVG | 2,750 | 3.439332694 | 137,500 | 5.138302698 | 128,250 | 5.1080574 | <10 | <10 |
| 24 | 1&2nd | AVG | 15,423 | 4.188154779 | 1,825,000 | 6.261262869 | 87,750 | 4.9432471 | <10 | <10 |
| 25 | 1&2nd | AVG | 2,235 | 3.349277527 | 462,500 | 5.665111737 | 385,250 | 5.5857426 | <10 | 10 |

Case study 4 - Shelf Life Meat Industry



Case study 5 – Category issues in poultry industry

QAFS - Pre op swab

Plant CA Substrate: Swab Analyte: AC Negative: 34 Positive: 9

| Sample Date | Sample ID | Source | Equipment ID | Equipment Description | Test Type | Result | UOM |
|-------------|--------------|------------|--------------|--------------------------|-----------|---------|--------|
| 04/27/20 | CA4394636116 | Swab | 130 | Leg 1/4 unloader | Pre-op | 1.00 | CFU/mL |
| 04/27/20 | CA4394636117 | Swab | 349 | Metal detector | Pre-op | 1.00 | CFU/mL |
| 04/27/20 | CA4394636118 | Swab | 183 | Breast conveyor 2 | Pre-op | 7.50 | CFU/mL |
| 04/27/20 | CA4394636119 | Swab | 150 | Scale / printer | Pre-op | 1.00 | CFU/mL |
| 04/27/20 | CA4394636120 | Swab | 364 | Marinade mix tank for L2 | Pre-op | 3.30 | CFU/mL |
| 04/27/20 | CA4394636121 | Swab | 319 | Cooler 6 | Pre-op | 1.00 | CFU/mL |
| 04/27/20 | CA4394636122 | MARINATION | | | | 4900.00 | CFU/mL |
| 04/27/20 | CA4394636123 | MARINATION | | | Line 1 | 4999.00 | CFU/mL |
| 04/27/20 | CA4394636124 | MARINATION | | | Line 2 | 1.00 | CFU/mL |
| 04/27/20 | CA4394636125 | MARINATION | | | Line 3 | 910.00 | CFU/mL |
| 04/28/20 | CA4394845483 | MARINATION | | | Line 2 | 1.00 | CFU/mL |
| 04/28/20 | CA4394845454 | MARINATION | | | Line 3 | 8.60 | CFU/mL |
| 04/28/20 | CA4394845480 | Swab | 349 | Metal detector | Pre-op | 1.00 | CFU/mL |
| 04/28/20 | CA4394845481 | Swab | 156 | Packout bins | Pre-op | 1.00 | CFU/mL |
| 04/28/20 | CA4394845482 | Swab | 153 | Roller conveyor | Pre-op | 8.70 | CFU/mL |
| 04/28/20 | CA4394845455 | MARINATION | | | Line 4 | 1.00 | CFU/mL |
| 04/29/20 | CA4394946002 | Swab | 347 | Fillet Conveyor | Pre-op | 4.40 | CFU/mL |
| 04/29/20 | CA4394946003 | Swab | 139 | Leg 1/4 conveyor 1 | Pre-op | 8.30 | CFU/mL |
| 04/29/20 | CA4394946004 | Swab | 170 | Injector filters | Pre-op | 270.00 | CFU/mL |
| 04/29/20 | CA4394946005 | MARINATION | | | Initial | 1.00 | CFU/mL |
| 04/29/20 | CA4394946006 | MARINATION | | | Line 2 | 2500.00 | CFU/mL |
| 04/29/20 | CA4394946007 | MARINATION | | | Line 3 | 3.30 | CFU/mL |
| 04/29/20 | CA4394946008 | MARINATION | | | Line 4 | 180.00 | CFU/mL |
| 04/29/20 | CA4394946009 | MARINATION | | | | 1.00 | CFU/mL |
| 04/30/20 | CA4395046504 | MARINATION | | | Line 2 | 7.10 | CFU/mL |